

SEQUENCE LISTING

<110> Wolfram, Lawrence  
Letterio, John

<120> FUNCTIONALIZED TGF-BETA FUSION PROTEINS

<130> 4239-61302

<150> 60/242,292  
<151> 2000-10-20

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<170> PatentIn version 3.1

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Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr
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tgc aag acc atc gac atg gag ctg gtg aag cgg aag cgc atc gag gcc 144
Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala
35 40 45

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Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser
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Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu
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Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu
85 90 95

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Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu	
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Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro	
115 120 125	
cac agc tta tat atg ctg ttc aac acg tcg gag ctc cgg gaa gcg gtg	432
His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg Glu Ala Val	
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Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu	
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aag tta aaa gtg gag cag cac gtg gag cta tac cag aaa tac agc aat	528
Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn	
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gat tcc tgg cgc tac ctc agc aac cgg ctg ctg gcc ccc agt gac tca	576
Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser	
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225 230 235 240	
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Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His	
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Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys Val Arg	
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Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp Ile His	
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Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr	
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Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu 65	70	75	80
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Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu 100	105	110	
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Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu  
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Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
165 170 175

Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser  
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
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Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala His Ser Ser  
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225 230 235 240

Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro  
245 250 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Asp Tyr Lys Asp Asp Asp Asp Lys Ala Leu  
275 280 285

Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys Val Arg  
290 295 300

Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp Ile His  
305 310 315 320

Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr  
325 330 335

Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val Leu Ala Leu Tyr Asn  
340 345 350

Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys Val Pro Gln Ala  
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35 40 45

Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr  
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Gln Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala  
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Ser Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile  
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Val Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met  
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Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr  
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tgc aag acc atc gac atg gag ctg gtg aag cgg aag cgc atc gag gcc  
Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala  
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cag ggg gac gtg ccc ggc ccc ctt gag gca gta ctg gct ctt  
Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
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tac aac agt acc cgc gac cgg gta gcc ggg gaa agt gtc gaa ccg gag  
Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu  
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ccc gag cca gag ggc gac tac tac gcc aag gag gtc acc cgc gtg cta  
Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
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Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro  
115 120 125

cac agc tta tat atg ctg ttc aac acg tcg gag ctc cg <sup>g</sup> gaa g <sup>c</sup> g <sup>c</sup> g <sup>t</sup> His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg Glu Ala Val 130 135 140	432
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Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser  
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Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
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Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu  
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Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
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Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro  
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Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu  
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Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
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Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser  
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Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala His Ser Ser  
210 215 220

Ser Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn Gly Phe Asn  
225 230 235 240

Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro  
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Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser  
275 280 285

Thr Asp Tyr Lys Asp Asp Asp Lys Glu Lys Asn Cys Cys Val Arg  
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Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp Ile His  
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Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr  
325 330 335

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Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys Val Pro Gln Ala  
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35 40 45

Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr  
50 55 60

Gln Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala  
65 70 75 80

Ser Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile  
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Val Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met  
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Met Pro Pro  
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Val	Leu	Thr	Pro	Gly	Arg	Pro	Ala	Ala	Gly	Leu	Ser	Thr	Cys	Lys	Thr			
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Ile	Asp	Met	Glu	Leu	Val	Lys	Arg	Lys	Arg	Ile	Glu	Ala	Ile	Arg	Gly			
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cag	atc	ctg	tcc	aaa	cta	agg	ctc	gcc	agt	ccc	cca	agc	cag	ggg	gag	548		
Gln	Ile	Leu	Ser	Lys	Leu	Arg	Leu	Ala	Ser	Pro	Pro	Ser	Gln	Gly	Glu			
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Val	Pro	Pro	Gly	Pro	Leu	Pro	Glu	Ala	Val	Leu	Ala	Leu	Tyr	Asn	Ser			
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tat	atg	ttc	ttc	aat	acg	tca	gac	att	cg	gaa	gca	gtg	ccc	gaa	ccc	788		
Tyr	Met	Phe	Phe	Asn	Thr	Ser	Asp	Ile	Arg	Glu	Ala	Val	Pro	Glu	Pro			
							135		140		145							
cca	ttt	ctg	tcc	cgt	gca	gag	ctg	cgc	ttt	cag	aga	tta	aaa	tca	agt	836		
Pro	Leu	Leu	Ser	Arg	Ala	Glu	Leu	Arg	Leu	Gln	Arg	Leu	Lys	Ser	Ser			
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gtg	gag	caa	cat	gtg	gaa	ctc	tac	cag	aaa	tat	agc	aac	aat	tcc	tgg	884		
Val	Glu	Gln	His	Val	Glu	Leu	Tyr	Gln	Lys	Tyr	Ser	Asn	Asn	Ser	Trp			
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cgt	tac	ctt	gg	ttt	ac	ccg	ctg	acc	ccc	act	gat	acg	cct	gag	tgg	932		
Arg	Tyr	Leu	Gly	Asn	Arg	Leu	Leu	Thr	Pro	Thr	Asp	Thr	Pro	Glu	Trp			
							180		185		190		195					
ctg	tct	ttt	gac	gtc	act	gga	gtt	gta	cg	cag	tgg	ctg	aac	caa	gga	980		
Leu	Ser	Phe	Asp	Val	Thr	Gly	Val	Val	Arg	Gln	Trp	Leu	Asn	Gln	Gly			
							200		205		210							
gac	gga	ata	cag	ggc	ttt	cga	ttc	agc	gct	cac	tgc	tct	tgt	gac	agc	1028		
Asp	Gly	Ile	Gln	Gly	Phe	Arg	Phe	Ser	Ala	His	Cys	Ser	Cys	Asp	Ser			
							215		220		225							
aaa	gat	aa	aa	ctc	cac	gtg	gaa	atc	aa	ggg	atc	agc	ccc	aaa	cgt	1076		
Lys	Asp	Asn	Lys	Leu	His	Val	Glu	Ile	Asn	Gly	Ile	Ser	Pro	Lys	Arg			
							230		235		240							
cg	gg	g	ac	ct	gg	cc	atc	cat	gac	atg	aa	ccg	cc	ttc	ct	1124		
Arg	Gly	Asp	Leu	Gly	Thr	Ile	His	Asp	Met	Asn	Arg	Pro	Phe	Leu	Leu			

245

250

255

ctc atg gcc acc ccc ctg gaa agg gcc cag cac ctg cac agc tca cgg Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His Ser Ser Arg 260	265	270	275	1172
cac cg <sup>g</sup> aga gcc ctg gat acc aac gac tac aag gat gac gac gac aag His Arg Arg Ala Leu Asp Thr Asn Asp Tyr Lys Asp Asp Asp Asp Lys 280	285		290	1220
gcc ctg gat acc aac tat tgc ttc agc tcc aca gag aag aac tgc tgt Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys 295	300		305	1268
gtg cg <sup>g</sup> cag ctg tac att gac ttt agg aag gac ctg ggt tgg aag tgg Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp 310	315		320	1316
atc cac gag ccc aag ggc tac cat gcc aac ttc tgt ctg gga ccc tgc Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys 325	330		335	1364
ccc tat att tgg agc ctg gac aca cag tac agc aag gtc ctt gcc ctc Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val Leu Ala Leu 340	345	350	355	1412
tac aac caa cac aac ccg ggc gct tcg gcg tca ccg tgc tgc gtg ccg Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ser Pro Cys Cys Val Pro 360	365		370	1460
cag gct ttg gag cca ctg ccc atc gtc tac tac gtg ggt cgc aag ccc Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Val Gly Arg Lys Pro 375	380		385	1508
aag gtg gag cag ttg tcc aac atg att gtg cgc tcc tgc aag tgc agc Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys Lys Cys Ser 390	395		400	1556
tga agccccgcccc cggccggcccc ctccggcag gccccggcccc gccccggcccc cgc				1612

<210> 17  
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<213> Fusion

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<223> Encodes amino acid residues 1-5 of TGF-beta1

<220>  
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<220>  
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20 25 30

Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala  
35 40 45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser  
50 55 60

Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
65 70 75 80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala Asp Pro Glu  
85 90 95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
100 105 110

Met Val Asp Arg Asn Asn Ala Ile Tyr Glu Lys Thr Lys Asp Ile Ser  
115 120 125

His Ser Ile Tyr Met Phe Phe Asn Thr Ser Asp Ile Arg Glu Ala Val  
130 135 140

Pro Glu Pro Pro Leu Leu Ser Arg Ala Glu Leu Arg Leu Gln Arg Leu  
145 150 155 160

Lys Ser Ser Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
165 170 175

Asn Ser Trp Arg Tyr Leu Gly Asn Arg Leu Leu Thr Pro Thr Asp Thr  
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Asn Gln Gly Asp Gly Ile Gln Gly Phe Arg Phe Ser Ala His Cys Ser  
210 215 220

Cys Asp Ser Lys Asp Asn Lys Leu His Val Glu Ile Asn Gly Ile Ser  
225 230 235 240

Pro Lys Arg Arg Gly Asp Leu Gly Thr Ile His Asp Met Asn Arg Pro  
245 250 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Asp Tyr Lys Asp Asp  
275 280 285

Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys  
290 295 300

Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly  
305 310 315 320

Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu  
325 330 335

Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val  
340 345 350

Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ser Pro Cys  
355 360 365

Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly  
370 375 380

Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys  
385 390 395 400

Lys Cys Ser

<210> 18

<211> 73

<212> DNA

<213> artificial sequence

<220>

<223> synthetic oligonucleotide primer

<400> 18

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ttcagctcca cg

73

<210> 19

<211> 72

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<213> artificial sequence

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caggtgctgg gc                                         72

<210> 20
<211> 1624
<212> DNA
<213> Fusion

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<222> (348)..(1571)
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<223> Encodes amino acid residues 1-5 of TGF-beta1

<220>
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<222> (1182)..(1571)
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ctccctcgga cctgctggca gtagctcccc tatttaagaa cacccacttt tggatctcag      120
agagcgctca tctcgatttt taccctggtg gtatactgag acaccttgggt gtcagagcct      180
caccgcgact cctgctgctt tctccctcaa cctcaaatta ttcaggacta tcacctacct      240

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ttccttggga gaccccaccc cacaaggccct gcagggcg ggccctccgca tcccacctt	300
gccgagggtt cccgctctcc gaagtgcgtt ggggcgcgc ctcccc atg ccg ccc Met Pro Pro 1	356
tcg ggg ctg cgg cta ctg ccg ctt ctg ctc cca ctc ccg tgg ctt cta Ser Gly Leu Arg Leu Leu Pro Leu Leu Pro Leu Pro Trp Leu Leu 5 10 15	404
gtg ctg acg ccc ggg agg cca gcc gcg gga ctc tcc acc tgc aag acc Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr Cys Lys Thr 20 25 30 35	452
atc gac atg gag ctg gtg aaa cgg aag cgc atc gaa gcc atc cgt ggc Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala Ile Arg Gly 40 45 50	500
cag atc ctg tcc aaa cta agg ctc gcc agt ccc cca agc cag ggg gag Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser Gln Gly Glu 55 60 65	548
gta ccg ccc ggc ccc ctg ccc gag gcg gtg ctc gct ttg tac aac agc Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu Tyr Asn Ser 70 75 80	596
acc cgc gac cgg gtg gca ggc gag agc gcc gac cca gag ccg gag ccc Thr Arg Asp Arg Val Ala Gly Glu Ser Ala Asp Pro Glu Pro Glu Pro 85 90 95	644
gaa gcg gac tac tat gct aaa gag gtc acc cgc gtg cta atg gtg gac Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu Met Val Asp 100 105 110 115	692
cgc aac aac gcc atc tat gag aaa acc aaa gac atc tca cac agt ata Arg Asn Asn Ala Ile Tyr Glu Lys Thr Lys Asp Ile Ser His Ser Ile 120 125 130	740
tat atg ttc ttc aat acg tca gac att cgg gaa gca gtg ccc gaa ccc Tyr Met Phe Asn Thr Ser Asp Ile Arg Glu Ala Val Pro Glu Pro 135 140 145	788
cca ttg ctg tcc cgt gca gag ctg cgc ttg cag aga tta aaa tca agt Pro Leu Leu Ser Arg Ala Glu Leu Arg Leu Gln Arg Leu Lys Ser Ser 150 155 160	836
gtg gag caa cat gtg gaa ctc tac cag aaa tat agc aac aat tcc tgg Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn Asn Ser Trp 165 170 175	884
cgt tac ctt ggt aac cgg ctg acc ccc act gat acg cct gag tgg Arg Tyr Leu Gly Asn Arg Leu Leu Thr Pro Thr Asp Thr Pro Glu Trp 180 185 190 195	932
ctg tct ttt gac gtc act gga gtt gta cgg cag tgg ctg aac caa gga Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu Asn Gln Gly 200 205 210	980
gac gga ata cag ggc ttt cga ttc agc gct cac tgc tct tgt gac agc Asp Gly Ile Gln Gly Phe Arg Phe Ser Ala His Cys Ser Cys Asp Ser	1028

215	220	225	
aaa gat aac aaa ctc cac gtg gaa atc aac ggg atc agc ccc aaa cgt Lys Asp Asn Lys Leu His Val Glu Ile Asn Gly Ile Ser Pro Lys Arg 230	235	240	1076
cg <del>g</del> ggc gac ctg ggc acc atc cat gac atg aac cg <del>g</del> ccc ttc ctg ctc Arg Gly Asp Leu Gly Thr Ile His Asp Met Asn Arg Pro Phe Leu Leu 245	250	255	1124
ctc atg gcc acc ccc ctg gaa agg gcc cag cac ctg cac agc tca cg <del>g</del> Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His Ser Ser Arg 260	265	270	1172
cac cg <del>g</del> aga gcc ctg gat acc aac agc tac cca tac gac gtg cca gac His Arg Arg Ala Leu Asp Thr Asn Ser Tyr Pro Tyr Asp Val Pro Asp 280	285	290	1220
tac gca tct ctg gcc ctg gat acc aac tat tgc ttc agc tcc aca gag Tyr Ala Ser Leu Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu 295	300	305	1268
aag aac tgc tgt gtg cg <del>g</del> cag ctg tac att gac ttt agg aag gac ctg Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu 310	315	320	1316
ggt tgg aag tgg atc cac gag ccc aag ggc tac cat gcc aac ttc tgt Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys 325	330	335	1364
ctg gga ccc tgc ccc tat att tgg agc ctg gac aca cag tac agc aag Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys 340	345	350	1412
gtc ctt gcc ctc tac aac caa cac aac ccg ggc gct tcg gc <del>g</del> tca ccg Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ser Pro 360	365	370	1460
tgc tgc gtg ccg cag gct ttg gag cca ctg ccc atc gtc tac tac gtg Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val 375	380	385	1508
ggt cg <del>c</del> aag ccc aag gtg gag cag ttg tcc aac atg att gtg cg <del>c</del> tcc Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser 390	395	400	1556
tgc aag tgc agc tga agccccgcc <del>c</del> cgccccgcc <del>c</del> ctcccg <del>g</del> cag gcccggcccc Cys Lys Cys Ser 405			1611
ccccccgcccc cgc			1624

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<211> 407  
<212> PRT  
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Met	Pro	Pro	Ser	Gly	Leu	Arg	Leu	Leu	Pro	Leu	Leu	Pro	Leu	Pro
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Trp	Leu	Leu	Val	Leu	Thr	Pro	Gly	Arg	Pro	Ala	Ala	Gly	Leu	Ser	Thr
					20			25				30			

  

Cys	Lys	Thr	Ile	Asp	Met	Glu	Leu	Val	Lys	Arg	Lys	Arg	Ile	Glu	Ala
					35			40			45				

  

Ile	Arg	Gly	Gln	Ile	Leu	Ser	Lys	Leu	Arg	Leu	Ala	Ser	Pro	Pro	Ser
					50			55			60				

  

Gln	Gly	Glu	Val	Pro	Pro	Gly	Pro	Leu	Pro	Glu	Ala	Val	Leu	Ala	Leu
					65			70		75		80			

  

Tyr	Asn	Ser	Thr	Arg	Asp	Arg	Val	Ala	Gly	Glu	Ser	Ala	Asp	Pro	Glu
					85			90			95				

  

Pro	Glu	Pro	Glu	Ala	Asp	Tyr	Tyr	Ala	Lys	Glu	Val	Thr	Arg	Val	Leu
					100			105			110				

  

Met	Val	Asp	Arg	Asn	Asn	Ala	Ile	Tyr	Glu	Lys	Thr	Lys	Asp	Ile	Ser
						115			120			125			

  

His	Ser	Ile	Tyr	Met	Phe	Phe	Asn	Thr	Ser	Asp	Ile	Arg	Glu	Ala	Val
						130			135			140			

  

Pro	Glu	Pro	Pro	Leu	Leu	Ser	Arg	Ala	Glu	Leu	Arg	Leu	Gln	Arg	Leu
						145			150		155		160		

  

Lys	Ser	Ser	Val	Glu	Gln	His	Val	Glu	Leu	Tyr	Gln	Lys	Tyr	Ser	Asn
								165		170			175		

  

Asn	Ser	Trp	Arg	Tyr	Leu	Gly	Asn	Arg	Leu	Leu	Thr	Pro	Thr	Asp	Thr
								180		185			190		

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Asn Gln Gly Asp Gly Ile Gln Gly Phe Arg Phe Ser Ala His Cys Ser  
210 215 220

Cys Asp Ser Lys Asp Asn Lys Leu His Val Glu Ile Asn Gly Ile Ser  
225 230 235 240

Pro Lys Arg Arg Gly Asp Leu Gly Thr Ile His Asp Met Asn Arg Pro  
245 250 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Ser Tyr Pro Tyr Asp  
275 280 285

Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn Tyr Cys Phe Ser  
290 295 300

Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg  
305 310 315 320

Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala  
325 330 335

Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln  
340 345 350

Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser  
355 360 365

Ala Ser Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val  
370 375 380

Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile  
385 390 395 400

Val Arg Ser Cys Lys Cys Ser  
405

<210> 22  
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<213> artificial sequence

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accactact gtttcagctc cacggagaag aactgctgct tgccggcag                108

<210> 23
<211> 73
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<220>
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cagagatgctgtagtctggca cgtcgtatgg gtagctgttg gatatccagg ctggcggtg      60
ccgggagctg tgc                73

<210> 24
<211> 1284
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<220>
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<400> 24
atg cac tac tgt gtg ctg agc acc ttt ttg ctc ctg cat ctg gtc ccg      48
Met His Tyr Cys Val Leu Ser Thr Phe Leu Leu His Leu Val Pro
1          5             10            15

gtg gcg ctc agt ctg tct acc tgc agc acc ctc gac atg gat cag ttt
Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe
20          25            30

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atg cgc aag agg atc gag gcc atc cgc ggg cag atc ctg agc aag ctg Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu 35 40 45	144
aag ctc acc agc ccc ccg gaa gac tat ccg gag ccg gat gag gtc ccc Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu Val Pro 50 55 60	192
ccg gag gtg att tcc atc tac aac agt acc agg gac tta ctg cag gag Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu Gln Glu 65 70 75 80	240
aag gca agc cgg agg gca gcc gcc tgc gag cgc gag cgg agc gag cag Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Glu Gln 85 90 95	288
gag tac tac gcc aag gag gtt tat aaa atc gac atg ccg tcc cac ctc Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Ser His Leu 100 105 110	336
ccc tcc gaa aat gcc atc ccg ccc act ttc tac aga ccc tac ttc aga Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg 115 120 125	384
atc gtc cgc ttt gat gtc tca aca atg gag aaa aat gct tcg aat ctg Ile Val Arg Phe Asp Val Ser Thr Met Glu Lys Asn Ala Ser Asn Leu 130 135 140	432
gtg aag gca gag ttc agg gtc ttc cgc ttg caa aac ccc aaa gcc aga Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg 145 150 155 160	480
gtg gcc gag cag cgg att gaa ctg tat cag atc ctt aaa tcc aaa gac Val Ala Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp 165 170 175	528
tta aca tct ccc acc cag cgc tac atc gat agc aag gtt gtg aaa acc Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr 180 185 190	576
aga gcg gag ggt gaa tgg ctc tcc ttc gac gtg aca gac gct gtg cag Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val Gln 195 200 205	624
gag tgg ctt cac cac aaa gac agg aac ctg ggg ttt aaa ata agt tta Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu 210 215 220	672
cac tgc ccc tgc tgt acc ttc gtg ccg tct aat aat tac atc atc ccg His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro 225 230 235 240	720
aat aaa agc gaa gag ctc gag gcg aga ttt gca ggt att gat ggc acc Asn Lys Ser Glu Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr 245 250 255	768
tct aca tat gcc agt ggt gat cag aaa act ata aag tcc act agg aaa Ser Thr Tyr Ala Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys 260 265 270	816

aaa acc agt ggg aag acc cca cat ctc ctg cta atg ttg ttg ccc tcc Lys Thr Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser 275 280 285	864
tac aga ctg gag tca caa cag tcc agc cg <sup>g</sup> cg <sup>g</sup> aag aag cg <sup>c</sup> gct ttg Tyr Arg Leu Glu Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg Ala Leu 290 295 300	912
gat gct gcc gac tac aag gat gac gac aag gct ttg gat gct gcc Asp Ala Ala Asp Tyr Lys Asp Asp Asp Lys Ala Leu Asp Ala Ala 305 310 315 320	960
tac tgc ttt aga aat gtg cag gat aat tgc tgc ctt cgc cct ctt tac Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg Pro Leu Tyr 325 330 335	1008
att gat ttt aag agg gat ctt gga tgg aaa tgg atc cat gaa ccc aaa Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys 340 345 350	1056
ggg tac aat gct aac ttc tgt gct ggg gca tgc cca tat cta tgg agt Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr Leu Trp Ser 355 360 365	1104
tca gac actcaa cac acc aaa gtc ctc agc ctg tac aac acc ata aat Ser Asp Thr Gln His Thr Lys Val Leu Ser Leu Tyr Asn Thr Ile Asn 370 375 380	1152
ccc gaa gct tcc gct tcc cct tgc tgt gtg tcc cag gat ctg gaa cca Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp Leu Glu Pro 385 390 395 400	1200
ctg acc att ctc tat tac att gga aat acg ccc aag atc gaa cag ctt Leu Thr Ile Leu Tyr Tyr Ile Gly Asn Thr Pro Lys Ile Glu Gln Leu 405 410 415	1248
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Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe  
20 25 30

Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu  
35 40 45

Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu Val Pro  
50 55 60

Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu Gln Glu  
65 70 75 80

Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Glu Gln  
85 90 95

Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Ser His Leu  
100 105 110

Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg  
115 120 125

Ile Val Arg Phe Asp Val Ser Thr Met Glu Lys Asn Ala Ser Asn Leu  
130 135 140

Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg  
145 150 155 160

Val Ala Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp  
165 170 175

Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr  
180 185 190

Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val Gln  
195 200 205

Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu  
210 215 220

His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro  
225 230 235 240

Asn Lys Ser Glu Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr  
245 250 255

Ser Thr Tyr Ala Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys  
260 265 270

Lys Thr Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser  
275 280 285

Tyr Arg Leu Glu Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg Ala Leu  
290 295 300

Asp Ala Ala Asp Tyr Lys Asp Asp Asp Lys Ala Leu Asp Ala Ala  
305 310 315 320

Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg Pro Leu Tyr  
325 330 335

Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys  
340 345 350

Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr Leu Trp Ser  
355 360 365

Ser Asp Thr Gln His Thr Lys Val Leu Ser Leu Tyr Asn Thr Ile Asn  
370 375 380

Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp Leu Glu Pro  
385 390 395 400

Leu Thr Ile Leu Tyr Tyr Ile Gly Asn Thr Pro Lys Ile Glu Gln Leu  
405 410 415

Ser Asn Met Ile Val Lys Ser Cys Lys Cys Ser  
420 425

<210> 26  
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gtc ccg gtg gcg ctc agt ctg tct acc tgc agc acc ctc gac atg gat		97
Val Pro Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp		
15 20 25 30		
cag ttt atg cgc aag agg atc gag gcc atc cgc ggg cag atc ctg agc		145
Gln Phe Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser		
35 40 45		
aag ctg aag ctc acc agc ccc ccg gaa gac tat ccg gag ccg gat gag		193
Lys Leu Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu		
50 55 60		
gtc ccc ccg gag gtg att tcc atc tac aac agt acc agg gac tta ctg		241
Val Pro Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu		
65 70 75		
cag gag aag gca agc cgg agg gca gcc gcc tgc gag cgc gag ccg agc		289
Gln Glu Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser		
80 85 90		
gag cag gag tac tac gcc aag gag gtt tat aaa atc gac atg ccg tcc		337
Glu Gln Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Ser		
95 100 105 110		
cac ctc ccc tcc gaa aat gcc atc ccg ccc act ttc tac aga ccc tac		385
His Leu Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr		
115 120 125		
ttc aga atc gtc cgc ttt gat gtc tca aca atg gag aaa aat gct tcg		433
Phe Arg Ile Val Arg Phe Asp Val Ser Thr Met Glu Lys Asn Ala Ser		
130 135 140		
aat ctg gtg aag gca gag ttc agg gtc ttc cgc ttg caa aac ccc aaa		481

Asn Leu Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys			
145	150	155	
gcc aga gtg gcc gag cag cg att gaa ctg tat cag atc ctt aaa tcc		529	
Ala Arg Val Ala Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser			
160	165	170	
aaa gac tta aca tct ccc acc cag cgc tac atc gat agc aag gtt gtg		577	
Lys Asp Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val			
175	180	185	190
aaa acc aga gcg gag ggt gaa tgg ctc tcc gac gtg aca gac gct		625	
Lys Thr Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala			
195	200	205	
gtg cag gag tgg ctt cac cac aaa gac agg aac ctg ggg ttt aaa ata		673	
Val Gln Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile			
210	215	220	
agt tta cac tgc ccc tgc tgt acc ttc gtg ccg tct aat aat tac atc		721	
Ser Leu His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile			
225	230	235	
atc ccg aat aaa agc gaa gag ctc gag gcg aga ttt gca ggt att gat		769	
Ile Pro Asn Lys Ser Glu Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp			
240	245	250	
ggc acc tct aca tat gcc agt ggt gat cag aaa act ata aag tcc act		817	
Gly Thr Ser Thr Tyr Ala Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr			
255	260	265	270
agg aaa aaa acc agt ggg aag acc cca cat ctc ctg cta atg ttg ttg		865	
Arg Lys Lys Thr Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu			
275	280	285	
ccc tcc tac aga ctg gag tca caa cag tcc agc cgg cgg aag aag cgc		913	
Pro Ser Tyr Arg Leu Glu Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg			
290	295	300	
gct ttg gat gct gcc agc tac cca tac gac gtg cca gac tac gca tct		961	
Ala Leu Asp Ala Ala Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser			
305	310	315	
ctg gct ttg gat gct gcc tac tgc ttt aga aat gtg cag gat aat tgc		1009	
Leu Ala Leu Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys			
320	325	330	
tgc ctt cgc cct ctt tac att gat ttt aag agg gat ctt gga tgg aaa		1057	
Cys Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys			
335	340	345	350
tgg atc cat gaa ccc aaa ggg tac aat gct aac ttc tgt gct ggg gca		1105	
Trp Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala			
355	360	365	
tgc cca tat cta tgg agt tca gac act caa cac acc aaa gtc ctc agc		1153	
Cys Pro Tyr Leu Trp Ser Ser Asp Thr Gln His Thr Lys Val Leu Ser			
370	375	380	
ctg tac aac acc ata aat ccc gaa gct tcc gct tcc cct tgc tgt gtg		1201	
Leu Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val			

385

390

395

tcc cag gat ctg gaa cca ctg acc att ctc tat tac att gga aat acg 1249  
 Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Asn Thr  
 400 405 410

ccc aag atc gaa cag ctt tcc aat atg att gtc aag tct tgt aaa tgc 1297  
 Pro Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys  
 415 420 425 430

agc taa 1303  
 Ser

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Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe  
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Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu  
 35 40 45

Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu Val Pro  
 50 55 60

Pro Glu Val Ile Ser Ile Tyr Asn Ser Thr Arg Asp Leu Leu Gln Glu  
 65 70 75 80

Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Glu Gln  
 85 90 95

Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Ser His Leu  
100 105 110

Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg  
115 120 125

Ile Val Arg Phe Asp Val Ser Thr Met Glu Lys Asn Ala Ser Asn Leu  
130 135 140

Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg  
145 150 155 160

Val Ala Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp  
165 170 175

Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr  
180 185 190

Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val Gln  
195 200 205

Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu  
210 215 220

His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro  
225 230 235 240

Asn Lys Ser Glu Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr  
245 250 255

Ser Thr Tyr Ala Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys  
260 265 270

Lys Thr Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser  
275 280 285

Tyr Arg Leu Glu Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg Ala Leu  
290 295 300

Asp Ala Ala Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Ala  
305 310 315 320

Leu Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu  
325 330 335

Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile

340

345

350

His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro  
355 360 365

Tyr Leu Trp Ser Ser Asp Thr Gln His Thr Lys Val Leu Ser Leu Tyr  
370 375 380

Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln  
385 390 395 400

Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Asn Thr Pro Lys  
405 410 415

Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys Ser  
420 425 430

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48

aca atc agc ctc tct ctg act tgc acc acg ttg gac ttc ggc cac  
Thr Ile Ser Leu Ser Thr Cys Thr Thr Leu Asp Phe Gly His  
20 25 30

96

atc aag aag aag agg gtg gaa gcc att agg gga cag atc ttg agc aag Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys 35 40 45	144
ctc agg ctc acc agc ccc cct gag cca tcg gtg atg acc cac gtc ccc Leu Arg Leu Thr Ser Pro Pro Glu Pro Ser Val Met Thr His Val Pro 50 55 60	192
tat cag gtc ctg gca ctt tac aac agc acc cgg gag ttg ctg gaa gag Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu 65 70 75 80	240
atg cac ggg gag agg gag gaa ggc tgc act cag gag acc tcg gag tct Met His Gly Glu Arg Glu Gly Cys Thr Gln Glu Thr Ser Glu Ser 85 90 95	288
gag tac tat gcc aaa gag atc cat aaa ttc gac atg atc cag gga ctg Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu 100 105 110	336
gcg gag cac aat gaa ctg gcc gtc tgc ccc aaa gga att acc tct aag Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys 115 120 125	384
gtt ttt cgt ttc aat gtg tcc tca gtg gag aaa aat gga acc aat ctg Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Gly Thr Asn Leu 130 135 140	432
ttc cgg gca gag ttc cgg gtc ttg cgg gtg ccc aac ccc agc tcc aag Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser Ser Lys 145 150 155 160	480
cgc aca gag cag aga att gag ctc ttc cag ata ctt cga ccg gat gag Arg Thr Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro Asp Glu 165 170 175	528
cac ata gcc aag cag cgc tac ata ggt ggc aag aat ctg ccc aca agg His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro Thr Arg 180 185 190	576
ggc acc gct gaa tgg ctg tct ttc gat gtc act gac act gtg cgc gag Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu 195 200 205	624
tgg ctg ttg agg aga gag tcc aac ttg ggt ctg gaa atc agc atc cac Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His 210 215 220	672
tgt cca tgt cac acc ttt cag ccc aat gga gac ata ctg gaa aat gtt Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Val 225 230 235 240	720
cat gag gtg atg gaa atc aaa ttc aaa gga gtg gac aat gaa gat gac His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp 245 250 255	768
cat ggc cgt gga gac ctg ggg cgt ctc aag aag caa aag gat cac cac His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp His His 260 265 270	816
aac cca cac ctg atc ctc atg atg atc ccc cca cac cga ctg gac agc	864

Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu Asp Ser			
275	280	285	
cca ggc cag ggc agt cag agg aag aag agg gcc ctg gac acc aat gac		912	
Pro Gly Gln Gly Ser Gln Arg Lys Lys Arg Ala Leu Asp Thr Asn Asp			
290	295	300	
tac aag gat gac gac aag gcc ctg gac acc aat tac tgc ttc cgc		960	
Tyr Lys Asp Asp Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Arg			
305	310	315	320
aac ctg gag gag aac tgc tgt gta cgc ccc ctt tat att gac ttc cgg		1008	
Asn Leu Glu Glu Asn Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg			
325	330	335	
cag gat cta ggc tgg aaa tgg gtc cac gaa cct aag ggt tac tat gcc		1056	
Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro Lys Gly Tyr Tyr Ala			
340	345	350	
aac ttc tgc tca ggc cct tgc cca tac ctc cgc agc gca gac aca acc		1104	
Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg Ser Ala Asp Thr Thr			
355	360	365	
cat agc acg gtg ctt gga cta tac aac acc ctg aac cca gag gcg tct		1152	
His Ser Thr Val Leu Gly Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser			
370	375	380	
gcc tcg cca tgc tgc gtc ccc cag gac ctg gag ccc ctg acc atc ttg		1200	
Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu			
385	390	395	400
tac tat gtg ggc aga acc ccc aag gtg gag cag ctg tcc aac atg gtg		1248	
Tyr Tyr Val Gly Arg Thr Pro Lys Val Glu Gln Leu Ser Asn Met Val			
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Val Lys Ser Cys Lys Cys Ser			
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Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys  
35 40 45

Leu Arg Leu Thr Ser Pro Pro Glu Pro Ser Val Met Thr His Val Pro  
50 55 60

Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu  
65 70 75 80

Met His Gly Glu Arg Glu Glu Gly Cys Thr Gln Glu Thr Ser Glu Ser  
85 90 95

Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu  
100 105 110

Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys  
115 120 125

Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Gly Thr Asn Leu  
130 135 140

Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser Ser Lys  
145 150 155 160

Arg Thr Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro Asp Glu  
165 170 175

His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro Thr Arg  
180 185 190

Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu  
195 200 205

Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His  
210 215 220

Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Val  
225 230 235 240

His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp  
245 250 255

His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp His His  
260 265 270

Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu Asp Ser  
275 280 285

Pro Gly Gln Gly Ser Gln Arg Lys Lys Arg Ala Leu Asp Thr Asn Asp  
290 295 300

Tyr Lys Asp Asp Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Arg  
305 310 315 320

Asn Leu Glu Glu Asn Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg  
325 330 335

Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro Lys Gly Tyr Tyr Ala  
340 345 350

Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg Ser Ala Asp Thr Thr  
355 360 365

His Ser Thr Val Leu Gly Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser  
370 375 380

Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu  
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Val Lys Ser Cys Lys Cys Ser  
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1 5 10 15		
aca atc agc ctc tct ctg tcc act tgc acc acg ttg gac ttc ggc cac	96	
Thr Ile Ser Leu Ser Leu Ser Thr Cys Thr Thr Leu Asp Phe Gly His		
20 25 30		
atc aag aag aag agg gtg gaa gcc att agg gga cag atc ttg agc aag	144	
Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys		
35 40 45		
ctc agg ctc acc agc ccc cct gag cca tcg gtg atg acc cac gtc ccc	192	
Leu Arg Leu Thr Ser Pro Pro Glu Pro Ser Val Met Thr His Val Pro		
50 55 60		
tat cag gtc ctg gca ctt tac aac agc acc cgg gag ttg ctg gaa gag	240	
Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu		
65 70 75 80		
atg cac ggg gag agg gag gaa ggc tgc act cag gag acc tcg gag tct	288	
Met His Gly Glu Arg Glu Gly Cys Thr Gln Glu Thr Ser Glu Ser		
85 90 95		
gag tac tat gcc aaa gag atc cat aaa ttc gac atg atc cag gga ctg	336	
Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu		
100 105 110		
gcg gag cac aat gaa ctg gcc gtc tgc ccc aaa gga att acc tct aag	384	
Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys		
115 120 125		
gtt ttt cgt ttc aat gtg tcc tca gtg gag aaa aat gga acc aat ctg	432	
Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Gly Thr Asn Leu		
130 135 140		
ttc cgg gca gag ttc cgg gtc ttg cgg gtg ccc aac ccc agc tcc aag	480	
Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser Ser Lys		
145 150 155 160		
cgc aca gag cag aga att gag ctc ttc cag ata ctt cga ccg gat gag	528	
Arg Thr Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro Asp Glu		
165 170 175		

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ggc acc gct gaa tgg ctg tct ttc gat gtc act gac act gtg cgc gag Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu 195 200 205	624
tgg ctg ttg agg aga gag tcc aac ttg ggt ctg gaa atc agc atc cac Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His 210 215 220	672
tgt cca tgt cac acc ttt cag ccc aat gga gac ata ctg gaa aat gtt Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Val 225 230 235 240	720
cat gag gtg atg gaa atc aaa ttc aaa gga gtg gac aat gaa gat gac His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp 245 250 255	768
cat ggc cgt gga gac ctg ggg cgt ctc aag aag caa aag gat cac cac His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp His His 260 265 270	816
aac cca cac ctg atc ctc atg atg atc ccc cca cac cga ctg gac agc Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu Asp Ser 275 280 285	864
cca ggc cag ggc agt cag agg aag aag agg gcc ctg gac acc aat agc Pro Gly Gln Gly Ser Gln Arg Lys Lys Arg Ala Leu Asp Thr Asn Ser 290 295 300	912
tac cca tac gac gtg cca gac tac gca tct ctg gcc ctg gac acc aat Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn 305 310 315 320	960
tac tgc ttc cgc aac ctg gag gag aac tgc tgt gta cgc ccc ctt tat Tyr Cys Phe Arg Asn Leu Glu Asn Cys Cys Val Arg Pro Leu Tyr 325 330 335	1008
att gac ttc cgg cag gat cta ggc tgg aaa tgg gtc cac gaa cct aag Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro Lys 340 345 350	1056
ggt tac tat gcc aac ttc tgc tca ggc cct tgc cca tac ctc cgc agc Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg Ser 355 360 365	1104
gca gac aca acc cat agc acg gtg ctt gga cta tac aac acc ctg aac Ala Asp Thr Thr His Ser Thr Val Leu Gly Leu Tyr Asn Thr Leu Asn 370 375 380	1152
cca gag gcg tct gcc tcg cca tgc tgc gtc ccc cag gac ctg gag ccc Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu Pro 385 390 395 400	1200
ctg acc atc ttg tac tat gtg ggc aga acc ccc aag gtg gag cag ctg Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr Pro Lys Val Glu Gln Leu 405 410 415	1248
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Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys  
35 40 45

Leu Arg Leu Thr Ser Pro Pro Glu Pro Ser Val Met Thr His Val Pro  
50 55 60

Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu  
65 70 75 80

Met His Gly Glu Arg Glu Glu Gly Cys Thr Gln Glu Thr Ser Glu Ser  
85 90 95

Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu  
100 105 110

Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys  
115 120 125

Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Gly Thr Asn Leu  
130 135 140

Phe Arg Ala Glu Phe-Arg Val Leu Arg Val Pro Asn Pro Ser Ser Lys  
145 150 155 160

Arg Thr Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro Asp Glu  
165 170 175

His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro Thr Arg  
180 185 190

Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu  
195 200 205

Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His  
210 215 220

Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Val  
225 230 235 240

His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp  
245 250 255

His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp His His  
260 265 270

Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu Asp Ser  
275 280 285

Pro Gly Gln Gly Ser Gln Arg Lys Lys Arg Ala Leu Asp Thr Asn Ser  
290 295 300

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn  
305 310 315 320

Tyr Cys Phe Arg Asn Leu Glu Asn Cys Cys Val Arg Pro Leu Tyr  
325 330 335

Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro Lys  
340 345 350

Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg Ser  
355 360 365

Ala Asp Thr Thr His Ser Thr Val Leu Gly Leu Tyr Asn Thr Leu Asn  
370 375 380

Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu Pro  
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ccg ctg ctg tgg ctg cta gtg ctg acg cct ggc cgg ccg gcc gcc gga 97  
Pro Leu Leu Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly  
15 20 25

ctg tcc acc tgc aag acc atc gac atg gag ctg gtg aag cgg aag cgc Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg 30 35 40 45	145
atc gag gcc att cgc ggc cag att ctg tcc aag ctt cgg ctt gcc agc Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser 50 55 60	193
ccc ccg agc cag ggg gac gtg ccg ccc ggc ccg ctg cct gag gca gta Pro Pro Ser Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val 65 70 75	241
ctg gct ctt tac aac agt acc cgc gac cgg gta gcc ggg gaa agt gtc Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val 80 85 90	289
gaa ccg gag ccc gag cca gag gcg gac tac tac gcc aag gag gtc acc Glu Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr 95 100 105	337
cgc gtg cta atg gtg gaa agc ggc aac caa atc tat gat aaa ttc aag Arg Val Leu Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys 110 115 120 125	385
ggc acc ccc cac agc tta tat atg ctg ttc aac acg tcg gag ctc ccg Gly Thr Pro His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg 130 135 140	433
gaa gcg gtg ccg gaa cct gta ttg ctc tct cgg gca gag ctg cgc ctg Glu Ala Val Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu 145 150 155	481
ctg agg ctc aag tta aaa gtg gag cag cac gtg gag cta tac cag aaa Leu Arg Leu Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys 160 165 170	529
tac agc aat gat tcc tgg cgc tac ctc agc aac cgg ctg ctg gcc ccc Tyr Ser Asn Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro 175 180 185	577
agt gac tca ccg gag tgg ctg tcc ttt gat gtc acc gga gtt gtg cgg Ser Asp Ser Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg 190 195 200 205	625
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ggg ttc aat tct ggc cgc cgg ggt gac ctg gcc acc att cac ggc atg Gly Phe Asn Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met 240 245 250	769
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cac ctg cac agc tcc cg <sup>g</sup> cac cgc cga gcc ctg gat acc aac gac tac His Leu His Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Asp Tyr 270 275 280 285	865
aag gat gac gac gac aag gcc ctg gat acc aac tac tgc ttc agc tcc Lys Asp Asp Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser 290 295 300	913
acg gag aag aac tgc tgc gtg cg <sup>g</sup> cag ctc tac att gac ttc cg <sup>g</sup> aag Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys 305 310 315	961
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ttc tgc ctg ggg ccc tgt ccc tac atc tgg agc cta gac act cag tac Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr 335 340 345	1057
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gc <sup>g</sup> cc <sup>g</sup> tgc tgc gtg cc <sup>g</sup> cag gc <sup>g</sup> ctg gag cca ctg ccc atc gtg tac Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr 370 375 380	1153
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cgt tcc tgc aag tgc agc tga ggccccgcc cgcacacgc cccgccacc Arg Ser Cys Lys Cys Ser 400	1252
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Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala  
35 40 45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser  
50 55 60

Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
65 70 75 80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu  
85 90 95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
100 105 110

Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro  
115 120 125

His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg Glu Ala Val  
130 135 140

Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Arg Leu  
145 150 155 160

Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
165 170 175

Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser  
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala His Ser Ser  
210 215 220

Ser Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn Gly Phe Asn  
225 230 235 240

Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro  
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Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Asp Tyr Lys Asp Asp  
275 280 285

Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys  
290 295 300

Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly  
305 310 315 320

Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu  
325 330 335

Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val  
340 345 350

Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys  
355 360 365

Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly  
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 Gly Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys  
 30 35 40

cgc atc gag gcc att cgc ggc cag att ctg tcc aag ctt cg<sup>g</sup> ctt gcc 194  
 Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala  
 45 50 55 60

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agc ccc ccg agc cag ggg gac gtg ccg ccc ggc ccg ctg cct gag gca      242
Ser Pro Pro Ser Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala
                         65          70          75

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gta ctg gct ctt tac aac agt acc cgc gac cggt gta gcc ggg gaa agt 290  
 Val Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser  
                   80                  85                  90

gtc gaa ccg gag ccc gag cca gag gcg gac tac tac gcc aag gag gtc 338  
 Val Glu Pro Glu Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val  
                  95                100                105

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acc cgc gtg cta atg gtg gaa agc ggc aac caa atc tat gat aaa ttc      386
Thr Arg Val Leu Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe
   110          115          120

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aag ggc acc ccc cac agc tta tat atg ctg ttc aac acg tcg gag ctc      434
Lys Gly Thr Pro His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu
125          130          135          140

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cg <sup>g</sup> gaa g <sup>c</sup> g g <sup>t</sup> g c <sup>c</sup> g gaa c <sup>c</sup> t gta t <sup>t</sup> g c <sup>t</sup> c t <sup>c</sup> t c <sup>g</sup> g g <sup>c</sup> a g <sup>a</sup> g c <sup>t</sup> g c <sup>c</sup> g Arg Glu Ala Val Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg 145 150 155	482
ct <sup>g</sup> ct <sup>g</sup> agg c <sup>t</sup> c a <sup>a</sup> g t <sup>t</sup> a a <sup>aa</sup> g <sup>t</sup> g g <sup>a</sup> g c <sup>a</sup> g c <sup>a</sup> c g <sup>t</sup> g g <sup>a</sup> g c <sup>t</sup> a t <sup>a</sup> c c <sup>a</sup> g Leu Leu Arg Leu Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln 160 165 170	530
aaa tac agc aat gat tcc t <sup>g</sup> g c <sup>g</sup> c tac c <sup>t</sup> c agc a <sup>a</sup> c c <sup>g</sup> g ct <sup>g</sup> ct <sup>g</sup> g <sup>c</sup> c Lys Tyr Ser Asn Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala 175 180 185	578
ccc agt gac tca c <sup>c</sup> g g <sup>a</sup> g t <sup>g</sup> g ct <sup>g</sup> t <sup>c</sup> c t <sup>t</sup> t gat g <sup>t</sup> c acc g <sup>g</sup> a g <sup>t</sup> t g <sup>t</sup> g Pro Ser Asp Ser Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val 190 195 200	626
cg <sup>g</sup> c <sup>a</sup> g t <sup>g</sup> g ct <sup>g</sup> acc c <sup>g</sup> c aga g <sup>a</sup> g g <sup>c</sup> t ata g <sup>a</sup> g g <sup>g</sup> t t <sup>t</sup> t c <sup>g</sup> c c <sup>t</sup> c agt Arg Gln Trp Leu Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser 205 210 215 220	674
gcc cac t <sup>g</sup> t t <sup>c</sup> c t <sup>t</sup> t gac agc a <sup>a</sup> a gat a <sup>a</sup> c a <sup>c</sup> a c <sup>t</sup> c c <sup>a</sup> c g <sup>t</sup> g g <sup>a</sup> a att Ala His Cys Ser Cys Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile 225 230 235	722
a <sup>a</sup> c g <sup>g</sup> g t <sup>t</sup> c a <sup>a</sup> t t <sup>c</sup> t g <sup>g</sup> c c <sup>g</sup> c c <sup>g</sup> g g <sup>g</sup> t gac ct <sup>g</sup> g <sup>c</sup> c acc att c <sup>a</sup> c g <sup>g</sup> c Asn Gly Phe Asn Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly 240 245 250	770
at <sup>g</sup> a <sup>a</sup> c c <sup>g</sup> g c <sup>c</sup> c t <sup>t</sup> c ct <sup>g</sup> c <sup>t</sup> c at <sup>g</sup> g <sup>c</sup> c acc c <sup>c</sup> g ct <sup>g</sup> g <sup>a</sup> g agg g <sup>c</sup> c Met Asn Arg Pro Phe Leu Leu Met Ala Thr Pro Leu Glu Arg Ala 255 260 265	818
c <sup>a</sup> g c <sup>a</sup> c ct <sup>g</sup> c <sup>a</sup> c agc t <sup>c</sup> c c <sup>g</sup> g c <sup>a</sup> c c <sup>g</sup> c c <sup>a</sup> g g <sup>c</sup> c ct <sup>g</sup> g <sup>a</sup> t acc a <sup>a</sup> c g <sup>a</sup> c Gln His Leu His Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Asp 270 275 280	866
t <sup>a</sup> c a <sup>a</sup> g g <sup>a</sup> t g <sup>a</sup> c g <sup>a</sup> c a <sup>a</sup> g g <sup>c</sup> c ct <sup>g</sup> g <sup>a</sup> t acc a <sup>a</sup> c t <sup>a</sup> c t <sup>g</sup> c t <sup>t</sup> c agc Tyr Lys Asp Asp Asp Lys Ala Leu Asp Thr Asn Tyr Cys Phe Ser 285 290 295 300	914
t <sup>c</sup> c ac <sup>g</sup> gag a <sup>a</sup> g a <sup>a</sup> c t <sup>g</sup> c t <sup>g</sup> c g <sup>t</sup> g c <sup>g</sup> g c <sup>a</sup> g c <sup>t</sup> c tac att g <sup>a</sup> c t <sup>t</sup> c c <sup>g</sup> g Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg 305 310 315	962
a <sup>a</sup> g g <sup>a</sup> c ct <sup>g</sup> g <sup>g</sup> c t <sup>g</sup> g a <sup>a</sup> g t <sup>g</sup> g att cat g <sup>a</sup> a c <sup>c</sup> c a <sup>a</sup> g g <sup>g</sup> c tac cat g <sup>c</sup> c Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala 320 325 330	1010
a <sup>a</sup> t t <sup>t</sup> c t <sup>g</sup> c ct <sup>g</sup> g <sup>g</sup> g c <sup>c</sup> c t <sup>t</sup> t c <sup>c</sup> c tac at <sup>c</sup> t g <sup>t</sup> g agc c <sup>t</sup> a g <sup>a</sup> c act c <sup>a</sup> g Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln 335 340 345	1058
t <sup>a</sup> c agc a <sup>a</sup> g g <sup>t</sup> c ct <sup>g</sup> g <sup>c</sup> t tac a <sup>a</sup> c c <sup>a</sup> g c <sup>a</sup> c a <sup>a</sup> c c <sup>c</sup> g g <sup>g</sup> c g <sup>c</sup> g t <sup>c</sup> g Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser 350 355 360	1106
g <sup>c</sup> g g <sup>c</sup> g c <sup>c</sup> g t <sup>g</sup> c t <sup>g</sup> g c <sup>c</sup> g c <sup>a</sup> g g <sup>c</sup> g ct <sup>g</sup> g <sup>a</sup> g c <sup>c</sup> a ct <sup>g</sup> c <sup>c</sup> c at <sup>c</sup> t g <sup>t</sup> g Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val 365 370 375 380	1154

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Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile		
385	390	395
gtg cgt tcc tgc aag tgc agc tga ggccccgccc cgcccacagc cccgcccacc		1256
Val Arg Ser Cys Lys Cys Ser		
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20	25	30
Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala		
35	40	45
Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser		
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Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu		
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		80
Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu		
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Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu		
100	105	110

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Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu  
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Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val  
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Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys  
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Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly  
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1

5

10

ccg ctg ctg tgg ctg cta gtg ctg acg cct ggc cg <sup>g</sup> ccg gcc g <sup>c</sup> gga Pro Leu Leu Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly	15	20	25	97
ctg tcc acc tgc aag acc atc gac atg gag ctg gtg aag cg <sup>g</sup> aag cg <sup>c</sup> Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg	30	35	40	145
atc gag gcc att cg <sup>c</sup> ggc cag att ctg tcc aag ctt cg <sup>g</sup> ctt gcc agc Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser	50	55	60	193
ccc ccg agc cag ggg gac gtg ccg ccc ggc ccg ctg cct gag gca gta Pro Pro Ser Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val	65	70	75	241
ctg gct ctt tac aac agt acc cg <sup>c</sup> gac cg <sup>g</sup> gta gcc ggg gaa agt gtc Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val	80	85	90	289
gaa ccg gag ccc gag cca gag gc <sup>g</sup> gac tac tac gcc aag gag gtc acc Glu Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr	95	100	105	337
cg <sup>c</sup> gtg cta atg gtg gaa agc gg <sup>c</sup> aac caa atc tat gat aaa ttc aag Arg Val Leu Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys	110	115	120	385
ggc acc ccc cac agc tta tat atg ctg ttc aac acg tcg gag ctc cg <sup>g</sup> Gly Thr Pro His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg	130	135	140	433
gaa gc <sup>g</sup> gtg ccg gaa cct gta ttg ctc tct cg <sup>g</sup> gca gag ctg cg <sup>c</sup> ctg Glu Ala Val Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu	145	150	155	481
ctg agg ctc aag tta aaa gtg gag cag cac gtg gag cta tac cag aaa Leu Arg Leu Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys	160	165	170	529
tac agc aat gat tcc tgg cg <sup>c</sup> tac ctc agc aac cg <sup>g</sup> ctg ctg gcc ccc Tyr Ser Asn Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro	175	180	185	577
agt gac tca ccg gag tgg ctg tcc ttt gat gtc acc gga gtt gtg cg <sup>g</sup> Ser Asp Ser Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg	190	195	200	625
cag tgg ctg acc cg <sup>c</sup> aga gag gct ata gag ggt ttt cg <sup>g</sup> ctc agt gcc Gln Trp Leu Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala	210	215	220	673
cac tct tcc tct gac agc aaa gat aac aca ctc cac gtg gaa att aac His Ser Ser Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn	225	230	235	721
ggg ttc aat tct ggc cg <sup>c</sup> cg <sup>g</sup> ggt gac ctg gcc acc att cac gg <sup>c</sup> atg Gly Phe Asn Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met	240	245	250	769

aac	cg	ccc	t	tc	c	tc	at	g	cc	cc	ct	g	ag	gg	gc	c	817
Asn	Arg	Pro	Phe	Leu	Leu	Leu	Met	Ala	Thr	Pro	Leu	Glu	Arg	Ala	Gln		
255				260				265									
cac	ct	g	c	ac	t	cc	cg	c	ac	cg	cc	ct	g	at	ac	ac	865
His	Leu	His	Ser	Ser	Arg	His	Arg	Ala	Leu	Asp	Thr	Asn	Ser	Tyr			
270			275			280			285								
cca	ta	c	ga	gt	cc	ga	ta	ca	t	ct	ct	g	at	ac	ac	913	
Pro	Tyr	Asp	Val	Pro	Asp	Tyr	Ala	Ser	Leu	Ala	Leu	Asp	Thr	Asn	Tyr		
			290			295			300								
tgc	tt	c	ac	tg	cc	ac	tg	tg	cg	cg	c	ct	ta	tt	961		
Cys	Phe	Ser	Ser	Thr	Glu	Lys	Asn	Cys	Cys	Val	Arg	Gln	Leu	Tyr	Ile		
305				310				315									
gac	tt	c	cg	a	g	g	ac	ct	gg	a	g	tg	tt	cc	a	1009	
Asp	Phe	Arg	Lys	Asp	Leu	Gly	Trp	Lys	Trp	Ile	His	Glu	Pro	Lys	Gly		
320				325				330									
tac	ca	g	cc	aa	t	tc	ct	gg	cc	t	cc	ta	cc	tt	961		
Tyr	His	Ala	Asn	Phe	Cys	Leu	Gly	Pro	Cys	Pro	Tyr	Ile	Trp	Ser	Leu		
335				340				345									
gac	ac	ca	tg	ac	g	tc	ct	tg	cc	ta	cc	ca	cc	cc	1105		
Asp	Thr	Gln	Tyr	Ser	Lys	Val	Leu	Ala	Leu	Tyr	Asn	Gln	His	Asn	Pro		
350				355				360				365					
ggc	gc	tc	gc	gc	cc	tg	cc	cg	cc	ct	gg	cc	ct	gg	1153		
Gly	Ala	Ser	Ala	Ala	Pro	Cys	Cys	Val	Pro	Gln	Ala	Leu	Glu	Pro	Leu		
				370				375				380					
ccc	at	tc	tg	ta	tc	gt	gg	cg	cc	a	ag	gt	gg	ca	tc	1201	
Pro	Ile	Val	Tyr	Tyr	Val	Gly	Arg	Lys	Pro	Lys	Val	Glu	Gln	Leu	Ser		
				385				390				395					
aac	at	g	tc	gt	cg	tcc	ta	g	gg	cccc	cccc	cc	cccc	cc	cc	1254	
Asn	Met	Ile	Val	Arg	Ser	Cys	Lys	Cys	Ser								
400				405													
cccgccccacc	ccggcaggcccc	ggccccaccc	ccgccccct	caccggggct	gtatttaagg											1314	
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Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr  
20 25 30

Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala  
35 40 45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser  
50 55 60

Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
65 70 75 80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu  
85 90 95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
100 105 110

Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro  
115 120 125

His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg Glu Ala Val  
130 135 140

Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu  
145 150 155 160

Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
165 170 175

Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser  
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala His Ser Ser  
210 215 220

Ser Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn Gly Phe Asn  
225 230 235 240

Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro  
245 250 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Ser Tyr Pro Tyr Asp  
275 280 285

Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn Tyr Cys Phe Ser  
290 295 300

Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg  
305 310 315 320

Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala  
325 330 335

Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln  
340 345 350

Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser  
355 360 365

Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val  
370 375 380

Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile  
385 390 395 400

Val Arg Ser Cys Lys Cys Ser  
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      1           5           10

ccg ctg ctg tgg ctg cta gtg acg cct ggc cgg ccg gcc gc gc gga      97
Pro Leu Leu Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly
      15          20          25

ctg tcc acc tgc aag acc atc gac atg gag ctg gtg aag cgg aag cgc      145
Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg
      30          35          40          45

atc gag gcc att cgc ggc cag att ctg tcc aag ctt cgg ctt gcc agc      193
Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser
      50          55          60

ccc ccg agc cag ggg gac gtg ccg ccc ggc ccg ctg cct gag gca gta      241
Pro Pro Ser Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val
      65          70          75

ctg gct ctt tac aac agt acc cgc gac cgg gta gcc ggg gaa agt gtc      289
Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val
      80          85          90

gaa ccg gag ccc gag cca gag gc gc gac tac tac gcc aag gag gtc acc      337
Glu Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr
      95          100         105

cgc gtg cta atg gtg gaa agc ggc aac caa atc tat gat aaa ttc aag      385
Arg Val Leu Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys

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110	115	120	125	
ggc acc ccc cac agc tta tat atg ctg ttc aac acg tcg gag ctc cgg Gly Thr Pro His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg				433
130	135	140		
gaa gcg gtg ccg gaa cct gta ttg ctc tct cgg gca gag ctg cgc ctg Glu Ala Val Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu				481
145	150	155		
ctg agg ctc aag tta aaa gtg gag cag cac gtg gag cta tac cag aaa Leu Arg Leu Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys				529
160	165	170		
tac agc aat gat tcc tgg cgc tac ctc agc aac cgg ctg ctg gcc ccc Tyr Ser Asn Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro				577
175	180	185		
agt gac tca ccg gag tgg ctg tcc ttt gat gtc acc gga gtt gtg cgg Ser Asp Ser Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg				625
190	195	200	205	
cag tgg ctg acc cgc aga gag gct ata gag ggt ttt cgc ctc agt gcc Gln Trp Leu Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala				673
210	215	220		
cac tgt tcc tgt gac agc aaa gat aac aca ctc cac gtg gaa att aac His Cys Ser Cys Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn				721
225	230	235		
ggg ttc aat tct ggc cgc cgg ggt gac ctg gcc acc att cac ggc atg Gly Phe Asn Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met				769
240	245	250		
aac cgccccc ttc ctg ctc atg gcc acc ccg ctg gag agg gcc cag Asn Arg Pro Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln				817
255	260	265		
cac ctg cac agc tcc cgg cac cgc cga gcc ctg gat acc aac agc tac His Leu His Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Ser Tyr				865
270	275	280	285	
cca tac gac gtg cca gac tac gca tct ctg gcc ctg gat acc aac tac Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn Tyr				913
290	295	300		
tgc ttc agc tcc acg gag aag aac tgc tgc gtg cgg cag ctc tac att Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile				961
305	310	315		
gac ttc cgg aag gac ctg ggc tgg aag tgg att cat gaa ccc aag ggc Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly				1009
320	325	330		
tac cat gcc aat ttc tgc ctg ggg ccc tgt ccc tac atc tgg agc cta Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu				1057
335	340	345		
gac act cag tac agc aag gtc ctg gct ctg tac aac cag cac aac ccg Asp Thr Gln Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro				1105
350	355	360	365	

ggc gcg tcg gcg ggc tgc gtg ccg cag ggc ctg gag cca ctg 1153  
Gly Ala Ser Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu  
370 375 380

ccc atc gtg tac tac gtg ggc cgc aag ccc aag gtg gag cag ctg tcc 1201  
Pro Ile Val Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser  
385 390 395

aac atg atc gtg cgt tcc tgc aag tgc agc tga ggccccgccc cgcccacagc 1254  
Asn Met Ile Val Arg Ser Cys Lys Cys Ser  
400 405

cccgccccacc cggcaggccc ggccccaccc cggccgcct caccggggct gtatttaagg 1314  
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Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr  
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Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala  
35 40 45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser  
50 55 60

Gln Gly Asp Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu  
65 70 75 80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Val Glu Pro Glu

85

90

95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu  
100 105 110

Met Val Glu Ser Gly Asn Gln Ile Tyr Asp Lys Phe Lys Gly Thr Pro  
115 120 125

His Ser Leu Tyr Met Leu Phe Asn Thr Ser Glu Leu Arg Glu Ala Val  
130 135 140

Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu  
145 150 155 160

Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn  
165 170 175

Asp Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser  
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu  
195 200 205

Thr Arg Arg Glu Ala Ile Glu Gly Phe Arg Leu Ser Ala His Cys Ser  
210 215 220

Cys Asp Ser Lys Asp Asn Thr Leu His Val Glu Ile Asn Gly Phe Asn  
225 230 235 240

Ser Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro  
245 250 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His  
260 265 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Ser Tyr Pro Tyr Asp  
275 280 285

Val Pro Asp Tyr Ala Ser Leu Ala Leu Asp Thr Asn Tyr Cys Phe Ser  
290 295 300

Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg  
305 310 315 320

Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala  
325 330 335

Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln  
340 345 350

Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser  
355 360 365

Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val  
370 375 380

Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile  
385 390 395 400

Val Arg Ser Cys Lys Cys Ser  
405